

AMENDMENTS TO THE CLAIMS

1. (currently amended). A submount comprising:

a submount substrate, said submount substrate having a surface roughness R_a that is less than or equal to 0.1 micron and a flatness that is less than or equal to 5 microns; and

a solder layer comprising at least a first metal and a second metal in a specific mass ratio formed on a primary surface of said submount substrate, said solder layer having a thickness that is at least 0.1 micron and is no more than 10 microns, and having a

~~wherein the relative density of said solder layer before melting~~ that is at least ~~80%~~ 50% and no more than 99.9% of the theoretical density of said solder layer.

2. (previously presented): A submount as described in claim 1 wherein said solder layer contains at least one of the following: gold-tin alloy, silver-tin alloy, and lead-tin alloy.

3. (previously presented): A submount as described in claim 1 wherein said solder layer before melting is formed on said submount substrate and includes a first layer containing silver and a second layer, formed on said first layer, containing tin.

4. (original): A submount as described in claim 1 further comprising an electrode layer formed between said submount substrate and said solder layer.

5 (original): A submount as described in claim 4 wherein said electrode layer contains gold.

6. (previously presented): A submount as described in claim 4 further comprising a solder

11. (previously presented) The submount as described in claim 1, wherein said first metal is gold and said gold is either at least 65% by mass and no more than 85% by mass, or at least 5% by mass and no more than 20% by mass of said solder layer.

12. (previously presented) The submount as described in claim 1, wherein said first metal is silver and said silver is no more than 72% by mass of said solder layer.

13. (currently amended) A submount comprising:

a submount substrate; and

a solder layer comprising at least a first metal and a second metal in a specific mass ratio formed on a primary surface of said submount substrate, wherein said solder layer is formed on the primary surface of said submount substrate by a film-formation process having a film-formation rate of between 1.8 nm/sec and 10 nm/sec, such that

wherein said solder layer is formed using a solder film formation rate of at least 1.3 nm/sec so that the relative density of said solder layer before melting is at least 80% and no more than 99.9% 50% of the theoretical density of said solder layer.